APPENDIX T.1
Portfolio Class Profile Form

SC4075
Portfolio Sequence Number

DIRECTIONS: Photocopy or download this form (http://www.ctbest.org, click on "Portfolio Resource Documents") and fill it out completely. Include it as the **COVER PAGE (first page)** of your portfolio.

1. Grade level(s) in your portfolio class: pre-k k 1 2 3 4 5 6 7 8 (9) 10 11 12
(Circle all that apply)

Portfolio school configuration : ☐ **ELEMENTARY** ☐ **MIDDLE SCHOOL**
☒ **HIGH SCHOOL** ☐ **SPECIAL EDUCATION FACILITY**

2. Portfolio content area (*check appropriate box and blank*):

☐ **ELEMENTARY**

☐ **ENGLISH LANGUAGE ARTS**

☐ **MATHEMATICS:** Course name: _____

☐ **MUSIC** ___Choral ___Instrumental

☐ **PHYSICAL EDUCATION**

☒ **SCIENCE** ___General ✓Biology ___Chemistry ___Physics ___Earth

☐ **SOCIAL STUDIES** ___World History ___U.S. History ___Geography
___Ancient Civilizations Civics/Government ___Other

☐ **SPECIAL EDUCATION** ___Language Arts ___Mathematics

☐ **VISUAL ARTS** ___Drawing/Painting ___Ceramics ___Photography
___Printmaking ___Sculpture ___Crafts Other: _____

☐ **WORLD LANGUAGES** ___French ___Spanish ___Italian _____ Other *(please specify)*

3. Portfolio.Teaching Topic/Unit Title: NERVOUS SYSTEM

4. Number of minutes per class: 4/5 - 83 MIN

5. Total number of students in class: 17
# of boys 3 # of girls 14 # of LEP students Ø # of special education students Ø

6. Primary texts or electronic resources used in portfolio unit, if applicable. *(Please provide title, author/publisher, and date of publication of all textbooks; website addresses from which unit content or materials were used.)*
MODERN BIOLOGY - HOLT RINEHART + WINSTON 2002
BIOLOGY BY MILLER AND LEVINE 2004 PRENTICE HALL AND LAB MANUAL "SAME TEXT
http://Faculty.washington.edu/chudler/free.html ← Neuroscience for Kids"
http://www.exploratorium.edu/ti/human_body/DrunkEffect.html
(Note: Elementary education teachers should provide this information for both literacy and numeracy instruction)

7. Number of other adults in the room during portfolio instruction: Ø
Indicate all that apply ___paraprofessional ___co-teacher ___parent volunteer ___other

APPENDIX T.2

Science Portfolio Unit Overview

Course Biology Grade level 9th

Unit's Essential Question: What role does the spinal cord and peripheral N.S. play in the human body?

Lesson Date	Lesson's Main Concept	Students' Main Learning Activity
3/5/04	STS introduction structure of spinal cord, column, microstructure	Individual/ Group cooperative work on www
3/8/04	Reflex. Arcs; Axon transmission	Note taking Discussion model building cooperative learning lecture note taking
3/9/04	Reflexes vs Reactions; pathways involved/structures	Lecture note taking model building
3/10/04	Resting vs. action potential; Inquiry lab	Inquiry lab working in small groups note taking science investigation
3/11/04	Reaction time and aging; experimental variables in inquiry lab	Post lab discussion, students reading article discussion
3/12/04	STS presentations debate on bioethical problems with treatment	STS presentations and debate discussion
3/15/04	Unit assessment	Assessment open/ closed end questions

Introduction:

What essential question and main concepts will students explore during this unit? The question students will be exploring during this unit is what roles do the spinal cord and peripheral nerves play in the human body. The position and anatomy of the spinal cord will be introduced. The anatomical structures that allow the spinal cord to serve as part of the central nervous system and allow it to interface with the peripheral nervous system will be examined. Transmission of nerve impulses along axons will be examined also. We will define the role of the peripheral nervous system in maintaining homeostasis. Interruptions and injury to the spinal cord, and their devastating consequences will be used to demonstrate the important role this very delicate structure plays in the human body. Students will investigate treatment of spinal cord injuries and discuss the merits and controversy surrounding the issue of using stem cells. The goal of this unit is to prepare students to examine a societal issue through one aspect of human anatomy and physiology, and better-prepare them to debate, and ultimately, decide the future use of technology in the human arena.

How are these concepts connected to student learning before and after this unit? Instruction preceding this unit focused on the Central nervous system, specifically the brain. The focus concept was the role of the nervous system in stability and homeostasis of the organism. Structure of a neuron as the basic unit of the nervous system was covered. Comparisons were made across the mammalian spectrum and even primitive life forms with rudimentary nervous systems were introduced to illustrate that without a functioning system that allows the organism to read and respond to the environment, the health of the person is compromised. Homeostasis is a fundamental concept to life and this has been a recurring theme from our first analysis of cells to multi-cellular life -forms. The role that the spinal cord and peripheral nervous system play in homeostasis will build on this. Students were previously introduced to the "Neuroscience for Kids" website. This website will be used often, both in class and by students completing their projects. After this unit the role of sensory systems and homeostasis will be studied.

What do you know about students' ideas and learning needs relative to the unit's essential question prior to the start of the unit? My students are happy ninth graders, who like to investigate topics through their own efforts. They need more integration of mathematics as a tool of science. At the beginning of the term my students completed a project were they had to research a career that is based in Biology. A list of over 100 different careers that had biology at their core was provided.

They were allowed to choose the career. This was done to gauge their interests and their overwhelming interest was in the medical arts. I focus on using real world medical examples wherever possible as it plays to their interest. I find that this very social group of students work well together in small groups. The intrapersonal learners will benefit from lab assignments and other activities that allow them to engage each other in the learning process.

My students need to have a variety of instructional strategies to engage their different intelligences. I have ample access to visual technology in the classroom including SmartBoard and multimedia projection. This allows me to engage students who learn visually with projected diagrams, images and PowerPoint style instruction. A couple of students are auditory learners who can take effective notes from what is stated in class. A couple of my students learn in a kinesthetic mode will benefit from taking complex concepts and building simple models to explain them. The student will be allowed to choose the method of displaying the knowledge they acquire in the unit project by different methods that are comfortable to them (e.g., written, graphic, oral presentation).

How do you plan to apply what you know about your students' ideas and learning needs **to make the portfolio interesting and accessible and relevant to your class?** Considering the high level of interest in medical fields by my students, I will require them to explore an STS topic that relates to treatment of spinal cord injuries. Because their intelligences take different forms, a variety of instructional formats will be used including group work. I will arrange computer and website access to allow them to continue to integrate technology into their studies. An inquiry lab will allow them to explore what factors, external and internal, can affect reflexes and reaction time. This unit has an interdisciplinary component to it. My school is organized into clusters. At my request the other teachers for these students, in English, Math and Health will explore integral aspects that enhance the learning needs of these students with respect to the essential question. In Math the students will calculate reaction times from raw data obtained in the inquiry lab. The health teacher and I will work closely, as we have so far during the Human Biology section. The health teacher will explore at-risk behaviors for spinal cord injuries. Our English teacher will fulfill a dual role and assist the students on preparation of their STS projects. He will also use his knowledge as an attorney to explore the legal aspects of those who live with spinal cord injuries and the legalities of current medical research in stem cells to treat these injuries.